

UNITED STATES PATENT APPLICATION

OF

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FOR

SYSTEM AND METHOD FOR DYNAMICALLY DISABLING
RESUBMISSION OF HTTP REQUESTS

BACKGROUND OF THE INVENTION

Field of the Invention

5 The present invention relates to a system and method for dynamically disabling the resubmission of HyperText Transfer Protocol (HTTP) requests. More specifically, the present invention relates to a system and method for dynamically disabling the resubmission of HTTP requests using a client-side script.

Description of Related Art

10 For many web sites, resubmitting an HTTP request may not be desirable. For example, if an HTTP request relating to a particular e-commerce web page is submitted twice, it may not be clear whether the user intended to transmit a second request (e.g., order two items), modify a first request (e.g., request a second product instead of the first product), or ensure that the first request was received (e.g., only
15 one product desired).

 Conventional systems and methods exist for preventing a resubmission of an HTTP request. A control, such as the back button, may be concealed in order to prevent a user from returning to a particular web page. However, this technique may be overcome by manipulating by right-clicking within a web-browser window
20 and selecting the "Back" command.

 Additionally, some systems may attempt to prevent resubmissions by forcing the expiration of a particular web page by using a "Pragma: No-Cache" tag. A "Pragma: No-Cache" tag is designed to prevent a browser from maintaining a copy of the document in cache. However, it may be desirable to enable a user to return to

a particular page. For example, the user may want to manipulate a control that is unrelated to the request (e.g., a link to an advertiser's home page or another control that is unrelated to the submitted transaction) or review the page from which the HTTP request was generated (e.g., determine a price or shipment date for a transaction). Additionally, some browsers do not properly support the "Pragma: No-
 5 Cache" functionality under certain conditions (e.g., Internet Explorer fails to implement the functionality properly when a requested document is greater than 64 KB).

Similarly, some systems may attempt to prevent HTTP request
 10 resubmissions by programmatically determining that a particular page has been previously submitted by using a unique key with each page. This technique, however, requires a request of and response from the server, thereby placing a heavier burden on the server and increasing the wait-time for the client.

SUMMARY OF THE INVENTION

15 Accordingly, the present invention is directed to a system and method for dynamically disabling the resubmission of HTTP requests that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

An object of the present invention is to provide a system and method for
 20 dynamically disabling the resubmission of HTTP requests using a client-side script. By preventing a user from activating controls relating to a previously submitted HTTP request while enabling the user to activate other controls not relating to the

previously submitted HTTP request, the present invention may increase performance for a user while decreasing the burden on an associated server.

In one embodiment, the invention comprises receiving input relating to a functional group, wherein a functional group comprises at least two input controls, determining whether a member of the functional group has been previously activated, and, when a member of the functional group has been previously activated, selectively disabling the resubmission of the HTTP request.

In another embodiment, the invention is a network device comprising a network communication interface configured to receive a web page comprising a plurality of input controls from a network, wherein at least two of the plurality of input controls are group members of a functional group, an input device configured to receive user input relating to resubmission of the HTTP request, and a processor configured to selectively disable resubmission of the HTTP request when a functional group member has been previously submitted.

In another embodiment, the invention comprises a network communication interface configured to receive a web page comprising a plurality of input controls from a network, wherein at least two of the plurality of input controls are group members of a functional group input device means configured to receive user input relating to resubmission of the HTTP request, and processor means configured to selectively disable resubmission of the HTTP request when a functional group member has been previously submitted.

In yet another embodiment, the present invention comprises a computer readable medium having computer code embodied therein for selectively disabling resubmission of an HTTP request comprising computer readable program code devices configured as a network communication interface configured to receive a web page comprising a plurality of input controls from a network, wherein at least two of the plurality of input controls are group members of a functional group, computer readable program code devices configured to receive user input relating to resubmission of the HTTP request, and computer readable program code devices configured to selectively disable resubmission of the HTTP request when a functional group member has been previously submitted.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention. In the drawings:

FIG. 1 shows a block diagram of an embodiment of the present invention;

FIG. 2 shows a logic diagram in accordance with the present invention;

FIG. 3 shows an exemplary implementation of the present invention; and

FIG. 4 shows exemplary source code in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the preferred embodiment of the present invention, examples of which are illustrated in the drawings.

FIG. 1 shows a block diagram of an embodiment of the present invention. By way of overview, system 10 comprises a web server 110 configured to communicate with data store 115 and a plurality of network devices 122, 124, 130, 140, 152. Data store may comprise relational data from a relational database management system as well as non-relational data from sources such as Lightweight Directory Access protocol or Internet Message Access Protocol servers. In one embodiment, network devices 122, 124, 130, 140, 152 communicate with web server 110 via networks 100, 150. Networks 100, 150 may comprise any type of network, such as a local area network, wide area network, virtual private network, a wireless network, and/or the Internet.

FIG. 2 shows a logic diagram in accordance with the present invention. At step 200, the system is initiated. At step 210, the system receives user input relating to a functional group. At step 220, the system invokes a submit form function. At step 230, the system determines whether group members have been previously activated. If a group member has not been previously submitted, the system proceeds to step 240 and 280, thereby submitting the form data and setting a flag to indicate that a submission has occurred via a group member. If the system

determines that a group member has been previously submitted, the system proceeds to step 250 and determines whether confirmation has been allowed. If the system determines that confirmation is not allowed, the system proceeds to step 290. If the system determines that confirmation is allowed, the system proceeds to step 260. At step 260, the system renders a confirmation message. At step 270, the system determines whether input received in response to the confirmation message is affirmative. If the information is negative, the system proceeds to step 290 and the function terminates. If the information is affirmative, the system proceeds to step 280 and sends the form data to the server. After sending the form data to the server, the system terminates at step 290. Each of these acts is described in greater detail below.

At step 210, the system receives user input relating to a functional group. In one embodiment, a functional group comprises a plurality of user input controls. For example, members of a functional group may be a submit button and a cancel button in a web page. The members of a functional group may be identified by a unique key that is generated by a server responsible for serving web pages. Additionally, a developer may assign a unique key to a functional group at design time. In a preferred embodiment, the following Hyper Text Markup Language (HTML) may be used to implement the present invention:

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<A HREF="Javascript:submitForm(submitAction, 'KEY-ABC', false)">Submit</a>
<A HREF="Javascript:submitForm(submitAction, 'KEY-ABC', false)">Cancel</a>
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In the above example, the unique key is the ABC identifier, which identifies the submit and cancel button as being members of the same functional group. Other input controls having different unique keys (including no unique key) may form other functional groups. Additional techniques of establishing functional groups may also be used. In one embodiment, a functional group comprises at least two input controls, however it is possible to implement the present invention by designating a single input control as a functional group.

At step 220, the system invokes a submit form function. In one embodiment, the code depicted in FIG. 4 may be used to implement the functionality disclosed herein. At step 230, the system determines whether group members have been previously activated. In one embodiment, this functionality is implemented using a flag that is associated with the unique key. The flag may be saved in a cookie associated with the unique key. This functionality may be implemented as disclosed in the allowSubmit() function of FIG. 4. Other methods of determining whether a member of a functional group has been previously submitted are also possible.

If a group member has not been previously submitted, the system proceeds to step 240 and 280. At step 240, the system may set the flag associated with a functional group to indicate that a submission via a group member has occurred. At step 280, the system may send the form data to the server.

If, at step 230, the system determines that a group member has been previously submitted, the system proceeds to step 250 and determines whether

confirmation has been allowed. Step 250 is the step at which the system selectively disables the resubmission of the HTTP request. Specifically, when confirmation is allowed a user may allow the resubmission of an HTTP request based on the activation of a member of the functional group, despite the fact that an HTTP request has previously been submitted based on the activation of a member of the functional group. However, if confirmation is not allowed, then the user is not given the option to resubmit an HTTP request. In one embodiment, the system determines whether confirmation is allowed by evaluating an attribute associated with the input control. For example, an input control may include a true or false value after the unique key, as depicted below:

Submit

Cancel

If the confirmation attribute is true, activation is allowed and the system may proceed to step 260. If the confirmation attribute is false, the system may proceed to step 290, in which case the form data is not resubmitted. In one embodiment, the system may present an alert message indicating that a related response has been previously submitted and having no control enabling the HTTP request from being resubmitted (e.g., once the user selects OK, no HTTP request is sent to the server). In the embodiment disclosed in FIG. 4, whether the system proceeds to step 260 or 290 is based on the value of a confirmFlag variable, which is based on the confirmation attribute.

If the system determines that confirmation is allowed, the system proceeds to step 260. At step 260, the system renders a confirmation message including a control to enable the resubmission of the HTTP request. For example, the system may render a confirm message saying "This form has been previously submitted. Submitting again may result in an error. Do you want to submit?" as depicted in the allowSubmit() function in FIG. 4.

At step 270, the system determines whether input received in response to the confirmation message is affirmative. If the input value is affirmative (e.g., the user selects "OK"), the system may proceed to step 280 and resubmit the HTTP request. If the input is negative (e.g., the user selects "Cancel"), the system may disable the resubmission of the HTTP request. At step 290, the function terminates.

FIG. 3 shows an exemplary implementation of the present invention. This invention may be implemented on a conventional network device, such as a personal computer. In a preferred embodiment, the network device comprises a network communication interface configured to receive a web page comprising a plurality of input controls from a network, an input device such as a key board mouse and/or touch screen, and a processor configured to selectively disable HTTP request resubmission as described in greater detail below.

By way of overview, at step 300 the function is initiated. At step 310, a first web page is received. At step 320, input relating to a member of the functional group is received. At step 330, a response is submitted based on the received input. At step 340, a second web page is received. At step 350, input relating to a back

function is received. At step 360, the first web page is rendered. At step 370, input relating to a member of the functional group is again received. At step 380, the system prevents resubmission of the HTTP request. Each of these acts is explained in greater detail below.

5 At step 310, a first web page is received. For example, the web page may relate to a purchase transaction at an e-commerce site. The web page may include a plurality of controls. A subset of these controls may share a unique key and, therefore, belong to a functional group. For example, a submit and cancel key may both have the unique key of "ABC" and, therefore, be members of the functional group. Additionally, this first web page may include other controls that are not in the functional group. For example, these controls may not be directly related to the transaction (e.g., links to other web sites) or may be related but can be activated after a previous submission (e.g., controls that enable a user to query for information on related products).

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15 At step 320, input relating to a member of the functional group is received. For example, a user may select the "Submit" button. This received input may cause an HTTP response to be submitted at step 330. This response may cause a web server to update a database to reflect a new purchase, for example. At step 340, a second web page may be received in response to the submission of the HTTP
20 request in step 330 (although it is possible to implement the present invention if the system remains on the first page).

At step 350, input relating to a back function is received. For example, a user may select a back button in a browser window, right click in a browser window and select back, or otherwise activate a back function. At step 360, the first web page is again rendered. In one embodiment, rendering the first web page from a cache
5 associated with the network device.

At step 370, input relating to a member of the functional group is again received. For example, a user may attempt to activate either the submit button or the cancel button associated with the "ABC" functional group. At step 380, the system selectively disables resubmission of the HTTP request. Because the
10 confirmation attribute is false for the members of the "ABC" functional group, the user is not given a warning and opportunity to confirm his or her intention to resubmit the HTTP request. Instead, the user is presented with an alert screen that indicates that the HTTP request has been previously submitted with no control that enables the resubmission of the HTTP request.

15 It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.